Claims:

1. Imaging arrangement, comprising

a)   a nuclear spin tomography device to obtain data for locally-resolved imaging of the magnetic resonance behavior of the atomic nuclei in a selected field of view in a body, the device being made and programmed such that the body can be exposed by the device to high frequency and magnetic field gradient echo pulse sequences that produce magnetization in a body such that the magnetization of a medium that is flowing in at least one direction in space in the body can be attenuated by dephasing the spins of the atomic nuclei in the medium, and

b)   an MR contrast medium that is taken up by the body.

2. Arrangement according to claim 1, characterized in that the magnetization of the medium flowing in at least one direction in space in the body can be attenuated by dephasing of the spins by gradient moments of order i $M_i(t)$ being maximized in this direction in space according to the following relation:

$$M_i(t) = \gamma \cdot \int_0^t G(t') \cdot t'^i \, dt'$$

whereby

i   is an integer greater than zero,

γ is the gyromagnetic ratio of the atomic nuclei,

$G(t')$ is a time-dependent gradient field intensity in this direction in space and

t   is the time interval that has passed since the emission of a high frequency pulse for excitation of the atomic nuclei.

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3. Arrangement according to claim 2, wherein the magnetization of the medium flowing in at least one direction in space in the body can be attenuated by dephasing of the spins in that gradient moments of the first order $M_1(t)$ are maximized in this direction in space according to the following relation:

$$M_1(t) = \gamma \cdot \int_0^t G(t') \cdot t' dt'$$

4. Arrangement according to one of the preceding claims, wherein gradient echo pulse sequences can be produced in the respective directions in space by inserting the flow dephasing gradient pulses into flow-compensated imaging gradient echo pulse sequences.

5. Arrangement according to claim 4, wherein M_1 satisfies the following relation:

$$M_1(t; G_{bipolar}, t_{ramp}, t_{plateau}, t_{sep}) = \gamma \cdot G_{bipolar} \cdot (t_{ramp} + t_{plateau}) \cdot (2t_{ramp} + t_{plateau} + t_{sep}) \quad [7]$$

6. Arrangement according to one of the preceding claims, wherein the device

- a static magnet,

- gradient devices for producing gradient pulses in three directions in space that are orthogonal to one another,

- a transmission device for producing high frequency signals,

- a receiving device for high frequency signals,

- a device for triggering gradient devices and the transmission device,

- an evaluation device, and

- a display device [sic].

7. Arrangement according to one of the preceding claims, wherein the MR contrast medium can be administered intravenously to a human or animal body.

8. Arrangement according to one of the preceding claims, wherein the MR contrast medium is lymph-passable and/or plaque-passable.

9. Process for locally-resolved imaging of the magnetic resonance behavior of atomic nuclei in a selected field of view in a body in which data from the field of view are obtained by means of a nuclear spin tomography device by the body being exposed to high frequency and magnetic field gradient echo pulse sequences that produce magnetization in the body such that the magnetization of a medium flowing in at least one direction in space is attenuated in the body by dephasing of the spins of the atomic nuclei in the medium and by an MR contrast medium being supplied to the body.

10. Process according to claim 9, wherein the magnetization of the medium flowing in at least one direction in space in the body is attenuated by dephasing of the spins by the gradient moments of order i $M_i(t)$ being maximized in this direction in space according to the following relation:

$$M_i(t) = \gamma \cdot \int_0^t G(t') \cdot t'^i \, dt'$$

whereby

    i   is an integer greater than zero,

    γ is the gyromagnetic ratio of the atomic nuclei,

    $G(t')$ is a time-dependent gradient field intensity in this direction in space and

    t   is the time interval that has passed since the emission of a high frequency pulse for excitation of the atomic nuclei.

11. Process according to claim 10, wherein the magnetization of the medium flowing in at

least one direction in space in the body is attenuated by dephasing of the spins by the gradient moments of the first order $M_1(t)$ being maximized in this direction in space according to the following relation:

$$M_1(t) = \gamma \cdot \int_0^t G(t') \cdot t' dt'$$

12. Process according to one of claims 9-11, wherein gradient echo pulse sequences are produced in the respective directions in space by inserting the flow dephasing gradient pulses into flow-compensated imaging gradient echo pulse sequences .

13. Process according to claim 12, wherein M_1 satisfies the following relation:

$$M_1(t; G_{bipolar}, t_{ramp}, t_{plateau}, t_{sep}) = \gamma \cdot G_{bipolar} \cdot (t_{ramp} + t_{plateau}) \cdot (2t_{ramp} + t_{plateau} + t_{sep})$$

[7]

14. Process according to one of claims 9-13, wherein the MR contrast medium is administered intravenously to a human or animal body.

15. Process according to one of claims 9-14, wherein the MR contrast medium is lymph-passable and/or plaque-passable.